

U.S. Patent Application No. 10/607,612
Amendment dated March 22, 2006
Reply to Office Action of January 26, 2006

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A method for etching a polysilicon gate structure in a plasma etch chamber, comprising:

defining a pattern protecting a polysilicon film to be etched;

striking a plasma;

etching substantially all of the polysilicon film that is unprotected;

introducing a silicon containing gas at a flow rate greater than 25 standard cubic centimeters per minute (sccm), wherein the silicon containing gas is selected from the group consisting of SiH_3CH_3 , $\text{SiH}(\text{CH}_3)_3$, SiHCl_3 , SiBr_4 , and Tetraethyl orthosilicate (TEOS); and

etching a remainder of the polysilicon film while introducing a silicon containing gas.

Claims 2-3 canceled

4. (Currently Amended) The method of claim 1, wherein the silicon containing gas ~~further includes SiF_4~~ originates from a solid source of silicon introduced to the plasma etch chamber.

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5. (Original) The method of claim 1, wherein the method operation of etching substantially all of the polysilicon film that is unprotected includes,

executing a first etch to remove a hard mask; and

executing a second etch to remove the polysilicon film that is unprotected.

6. (Original) The method of claim 1, wherein the method operation of etching a remainder of the polysilicon film while introducing a silicon containing gas includes,

preventing notching at a base of the polysilicon gate structure.

7. (Original) The method of claim 1, wherein the method operation of introducing a silicon containing gas includes,

terminating the etching of the polysilicon film that is unprotected; and

striking an over etch plasma.

8. (Original) The method of claim 1, further comprising:

forming a passivation layer from byproducts generated from the etching of the polysilicon film.

9. (Currently Amended) A method for decreasing etch rate micro-loading between differently doped material of a substrate, comprising:

striking a plasma in a chamber;

etching a dual doped gate structure of the substrate, wherein the dual doped gate structure includes a n-doped polysilicon gate and a p-doped polysilicon gate,

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wherein the n-doped polysilicon gate and the p-doped polysilicon gate are
contemporaneously etched;

forming a passivation layer from byproducts generated from the etching; and
enhancing the passivation layer.

10. (Original) The method of claim 9, wherein the method operation of
enhancing the passivation layer includes,

flowing a silicon containing gas into the chamber during the etching.

11. (Previously Presented) The method of claim 10, further comprising:
flowing the silicon containing gas between a flow rate of about 25 standard
cubic centimeters per minute (sccm) and 300 sccm.

12. (Currently Amended) The method of claim 10, wherein the silicon
containing gas is selected from the group consisting of SiH_3CH_3 , $\text{SiH}(\text{CH}_3)_3$, SiF_4 ,
 SiHCl_3 , SiBr_4 , and Tetraethyl orthosilicate (TEOS).

13. (Canceled)

14. (Currently Amended) The method of claim 9 12, wherein the ~~silicon~~
~~containing gas group~~ further includes SiF_4 .

Claims 15-18 canceled

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19. (Currently Amended) A method for enhancing a polysilicon to oxide selectivity during an etching process, comprising:

providing a substrate to be plasma etched in a chamber;

striking a plasma in the chamber;

flowing a silicon containing gas into the chamber while performing an over etch step of the etching process, wherein the silicon containing gas is selected from the group consisting of SiH_3CH_3 , $\text{SiH}(\text{CH}_3)_2$, SiHCl_3 , and Tetraethyl orthosilicate (TEOS); and

depositing a layer of a silicon containing oxide over a gate oxide as the substrate is being etched, ~~while introducing oxygen into the chamber from a source external to the chamber.~~

20. (Cancelled)

21. (Previously Presented) The method of claim 19, wherein the method operation of depositing a layer of a silicon containing oxide over a gate oxide as the substrate is being etched occurs during an over etch step of the etching process.

22. (Previously Presented) The method of claim 19, wherein the method operation of depositing a layer of a silicon containing oxide over a gate oxide as the substrate is being etched causes a polysilicon to oxide selectivity to increase so as to prevent any etching of the gate oxide.

23. (Cancelled)

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24. (Currently Amended) The method of claim 24 19, wherein the ~~silicon~~
~~containing-gas group~~ further includes SiF_4 .

Claims 25-27 canceled

28. (Previously Presented) The method of claim 19, wherein the source is a
gas selected from the group consisting of O_2 , N_2O and CO_2 .

29. (New) The method of claim 19, wherein the source is an oxygen
containing solid material selected from the group consisting of quartz and aluminum
oxide.

30. (New) The method of claim 1, wherein the group of silicon containing
gases further includes SiBr_4 , SiF_4 and SiCl_4 .

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